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GREENBERG TRAURIG, LLP
77 WEST WACKER DRIVE
SUITE 2500
CHICAGO, IL 60601-1732

EXAMINER	
JARRETT, SCOTT L	

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/867,068
Filing Date: May 29, 2001
Appellant(s): SCHEER, ROBERT H.

Gary R. Jarosik
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed December 8, 2005 appealing from the Office action mailed September 21, 2005.

(1) Real Part of Interest

A statement identifying by name the real part of interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

2003/0055666	Roddy et al.	03-2003
2001/0034673	Yang et al.	10-2001

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims: The ground(s) for rejection are reproduced below from the Final Office Action, mailed September 21, 2005, and are provided here for the convenience of both the Appellant and the Board of Patent Appeals:

Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roddy et al., U.S. Patent Publication No. 2003/0055666 in view of Yang et al., U.S, Patent Publication No. 2001/0034673.

Regarding Claim 1 Roddy et al. teach a method and system for managing enterprise assets as part of a supply chain network wherein the system and method evaluates, identifies, predicts and manages the maintenance (service, repair, operation, overhaul) of the plurality of assets "...to avoid unexpected equipment failures and to accomplish maintenance and repair activities in an efficient manner", (Paragraphs 0024-0025; Abstract).

More specifically Roddy et al. teach an asset maintenance management method and system in a supply chain network (network: collection of businesses/entities, interconnected systems/processes, communication network) comprising:

- a customer maintenance system (Paragraph 0007; Figure 4) into which information pertaining to a work order (repair order, repair action; Paragraph 0082; Figure 9) is entered including information that identifies the piece of equipment (asset ID; Figure 2, Element 30) to be repaired and one or more items (parts, materials, personnel, equipment, facilities, service center, etc.) expected to be used during a repair procedure (service; e.g. materials/resource availability, inventory management; Paragraphs 0082-0083, 0087);

- a customer system (agent server, application, module, software, "expert system", Paragraph 0086; Figures 1, 4, 9) in communication (Internet, global communication/information network; Paragraphs 0006, 0027; Figure 1) with the maintenance system which extracts (pulls, collects, real-time data collection, monitors, queries, etc., Paragraph 0007-0008; Figures 5, 6; Figure 7, Element 122) from the maintenance system (subsystem) information that identifies what repairs/maintenance are to be performed wherein the maintenance specifies the parts,

equipment, and other resources necessary to perform the maintenance activity information (Paragraphs 0075, 0086; Figure 7, Element 134) to create an advanced (forecast, future, predicted, planned, projected, etc.) demand notice (signal, alert, message, etc.) order (work order, repair action, service recommendation, demand forecast, predicted repair/service/maintenance, purchase order; Paragraphs 0037; Figures 2, 3, 9) that identifies the items; and

- a distributor (maintenance repair centers, repair facilities) system in communication with a plurality of systems that respond to the advanced demand notice (message, signal) order (work/service order, work scope, service recommendation) to initiate the staging (placement, movement) of items expected to be used as part of the repair procedure ("The recommended action may be supplied directly into the train control system. At this time, the data center or service personnel may evaluate the most logical repair location in terms of various criteria, such as train proximity, parts, repair equipment availability, manpower availability, etc. The service recommendation automatically triggers the creation of an electronic work order 172 within a service shop management system. A notification is then sent, such as via an e-mail message or by providing information on an Internet web page, to the service team detailing the parts and labor necessary for a timely and accurate repair.", Paragraph 0086; "As soon as the service team receives information about the necessary repair, team members gather or reserve parts, equipment and personnel needed to perform the corrective action.", Paragraph 0087, "...inventory management, will be improved to have the correct part available when it is needed.", Paragraph 0081; Paragraphs 0082-0088; Figures 3-4, 8, 9).

FIG. 1

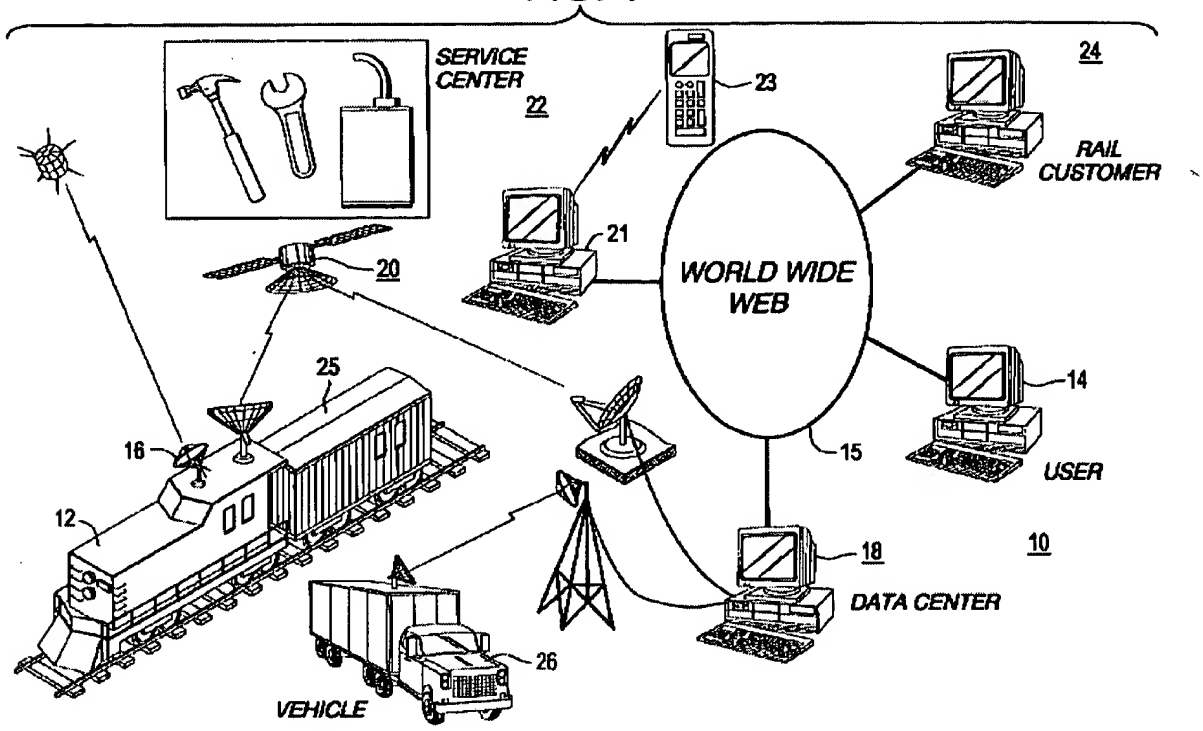

Figure 1: Roddy et al., Figure 1, Supply Chain/Enterprise Network

FIG. 2

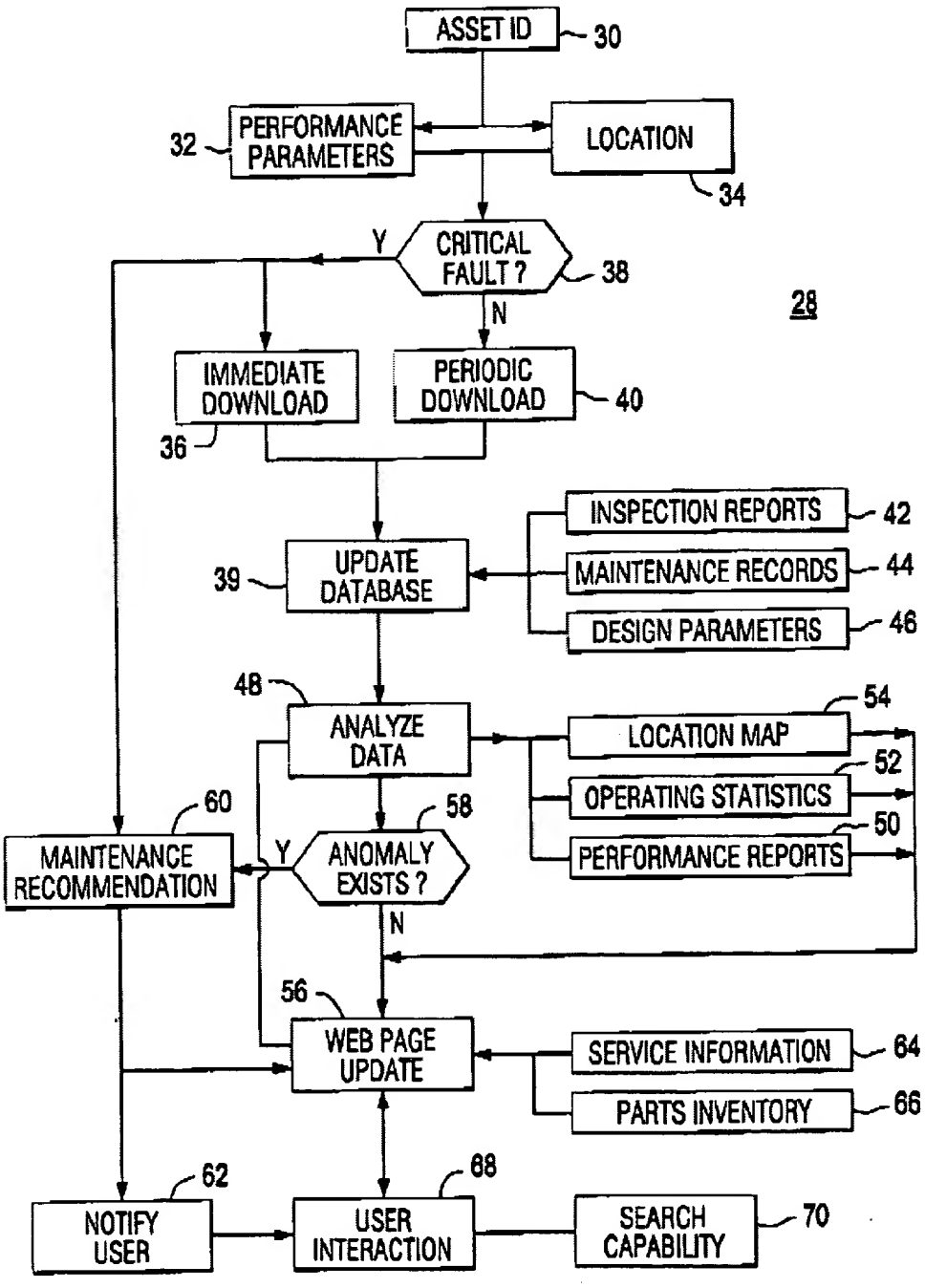

Figure 2: Roddy et al., Figure 2, Enterprise Asset Maintenance Management

FIG. 4

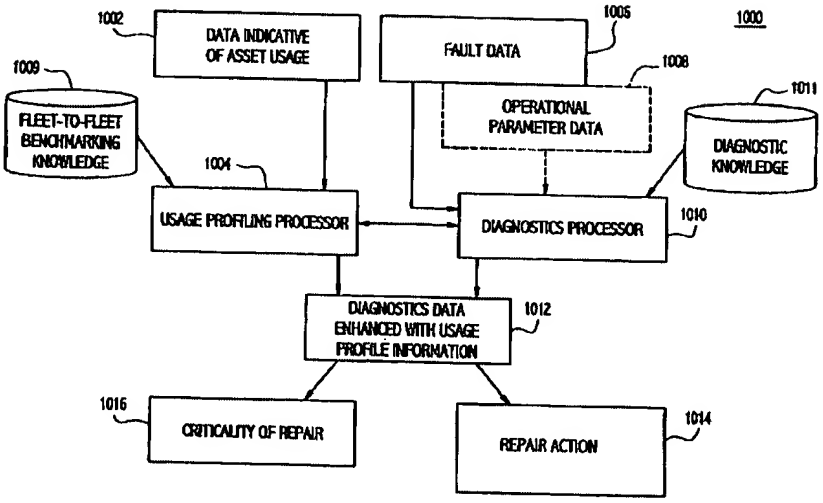

Figure 3: Figure 4, Asset Diagnostic System and Method

FIG. 8

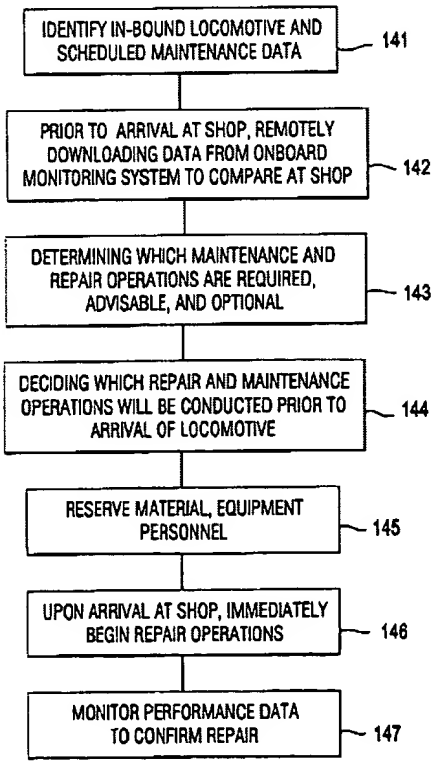

Figure 4: Roddy et al., Figure 8, Maintenance Information Extraction/Collection System and Method

FIG. 9

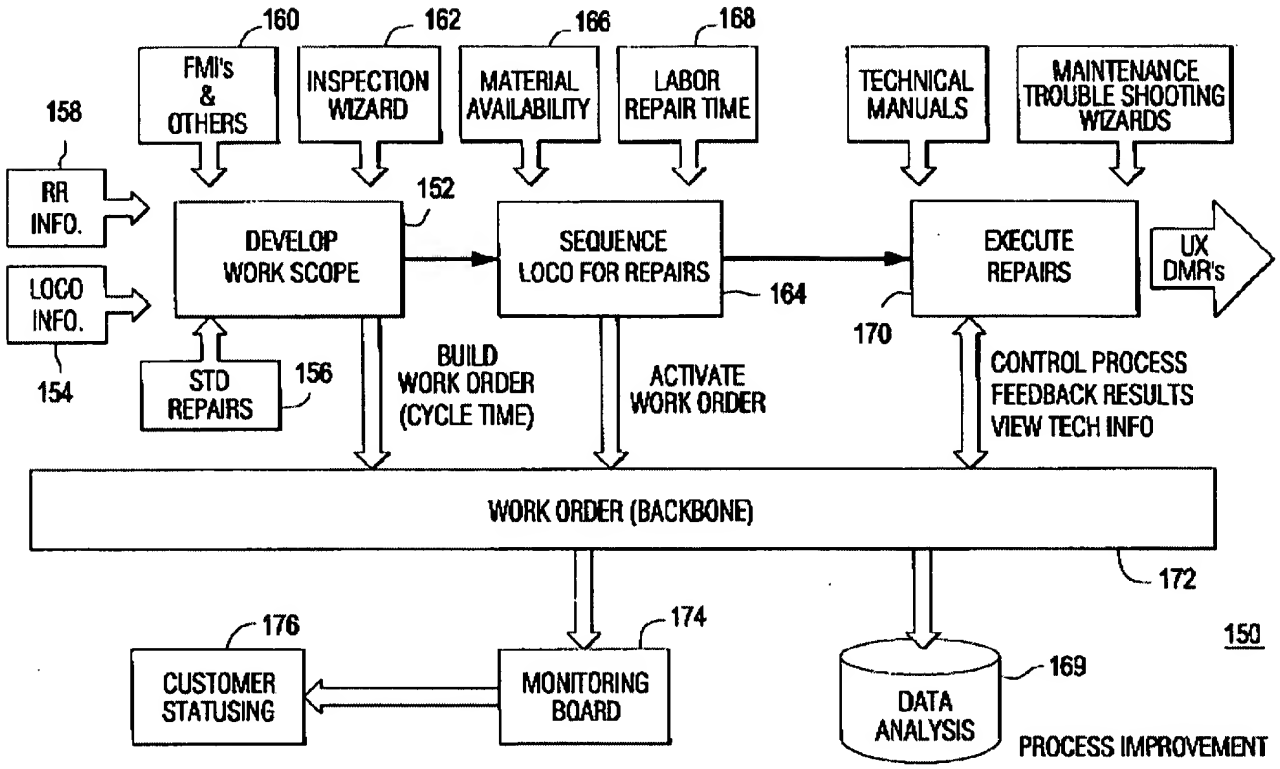

Figure 5: Roddy et al., Figure 9, Maintenance Work/Repair Order System and Method

While Roddy et al. teach that the asset maintenance management system and method utilizes expert systems (technologies, methods, techniques, sub-systems; Paragraph 0086) and well known e-Business technologies (Paragraph 0081) Roddy et al. does not expressly teach that the maintenance management system and method utilizes well known agent technologies, method, systems or techniques.

Official notice is taken that the use of intelligent agents (artificial intelligence, agent based systems) in e-Business, eCommerce, Supply Chain Management and the like is well established and well known. More specifically it is old and well known that a network of intelligent software modules (agents) can together dynamically (collaboratively) manage the

supply chain wherein each module (agent) is an: expert at its task, thereby optimizing its goals; coordinates its decisions with other modules, thereby optimizing supply chain wide goals; and can quickly responds to changes in cooperation with other modules.

It would have been obvious to one skilled in the art at the time of the invention to modify the method and system for asset maintenance management, specifically leveraging the system's utilization of expert systems and e-Business technologies, as taught by Roddy et al., to utilize an intelligent agents to manage the system and method for predictive maintenance and service parts fulfillment in a supply chain network in a substantially automated manner.

Regarding Claim 2 Roddy et al. teach that the method and system for asset maintenance management in a supply chain network (a collection of cooperative businesses/processes, etc.) further comprises a supplier system (e.g. a supplier of locomotives; Paragraph 0003) that cooperates (works with, communicates with, connects to, collaborates with) the distributor system (maintenance service centers; Paragraph 0026; Figure 1).

While Roddy et al. teach the utilization of inventory management systems, parts/item inventories as well as the determining of parts availability and the like in response/relation to the advance (future, forecast, schedule) repair notices (orders, work order, repair orders) Roddy et al. is silent on which specific entity supplies, provides or replenishes the expected repair items into the supply chain.

Yang et al. teach a service parts inventory management and planning method, system and marketplace (portal), in the analogous art of service planning/asset maintenance, for providing service parts (items, materials, resources) from a plurality of suppliers (sellers, vendors) into a supply chain network (electronic marketplace, portal; Abstract) for the purpose of facilitating the planning, management, distribution and fulfillment of service parts in a supply chain network comprising a plurality of suppliers, distributors and customers (multi-echelon inventory systems; Paragraphs 0007-0008; Figures 1-2).

Further Yang et al. teach that "A primary goal in service planning is therefore maintaining adequate service parts inventory to satisfy customer demands as they occur. In multi-echelon

inventory systems, the locations from which inventory is deployed may significantly impact the overall service level achieved.", (Paragraph 0005).

More generally Yang et al. teach that the service parts inventory management and planning method and system further comprises:

- a supply chain network including a plurality of collaborating planner systems (ERP/enterprise systems; Figure 3, Element 48; Paragraphs 0003, 0007, 0030, 0050);

- access by the plurality of planner systems to a plurality of service parts (items) information including but not limited to demand forecasts wherein demand forecasts for "...service parts based on data concerning the lifespan of products and their constituent parts, failure rates of products and their constituent parts, and any other suitable information.", (Paragraphs 0024, 0034);

- generating inventory, fulfillment and replenishment plans according to a plurality of information including but not limited to demand forecasts (Paragraphs 0018-0019);

- staging (locating, placing, stocking) service parts in accordance with the fulfillment/inventory plan (i.e. in response to future/forecasted demand, orders, etc.; "A manager application receives the inventory plan and, according to the inventory plan, initiates one or more services in an attempt to resolve at least a portion of the service parts excesses or needs at one or more of the stocking locations through interaction with one or more other entities.", Paragraph 0007);

- a procurement, order management and planning subsystem enabling customers, suppliers and distributors to collaborate (communicate) to obtain (purchase) service parts/items (Paragraphs 0020, 0038, 0042, 0046); and

- a service scheduling subsystem which coordinates parts requirements with service requests based on available service parts and ensures that parts are available at the repair site on or before the schedule service date (Paragraphs 0041-0043).

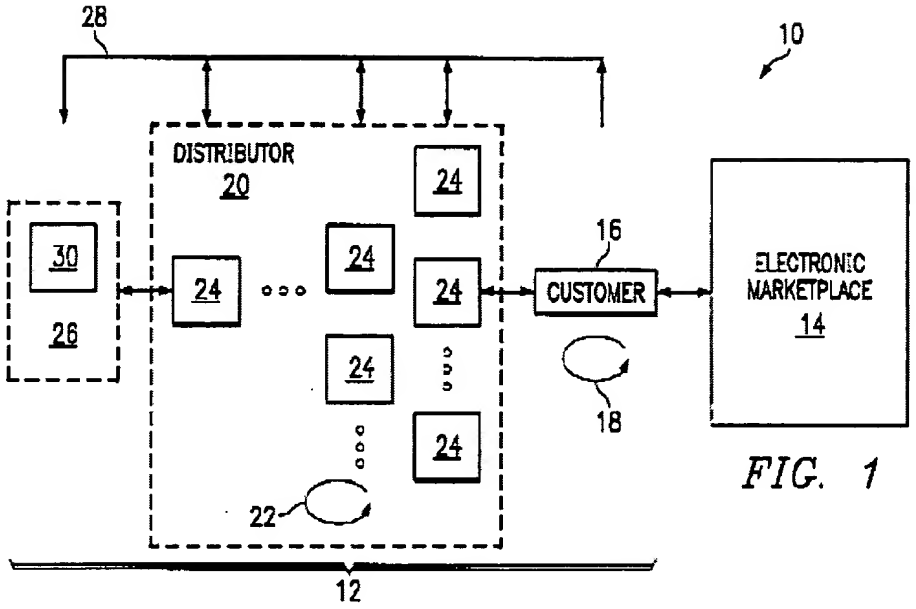

FIG. 1

Figure 6: Yang et al., Figure 1

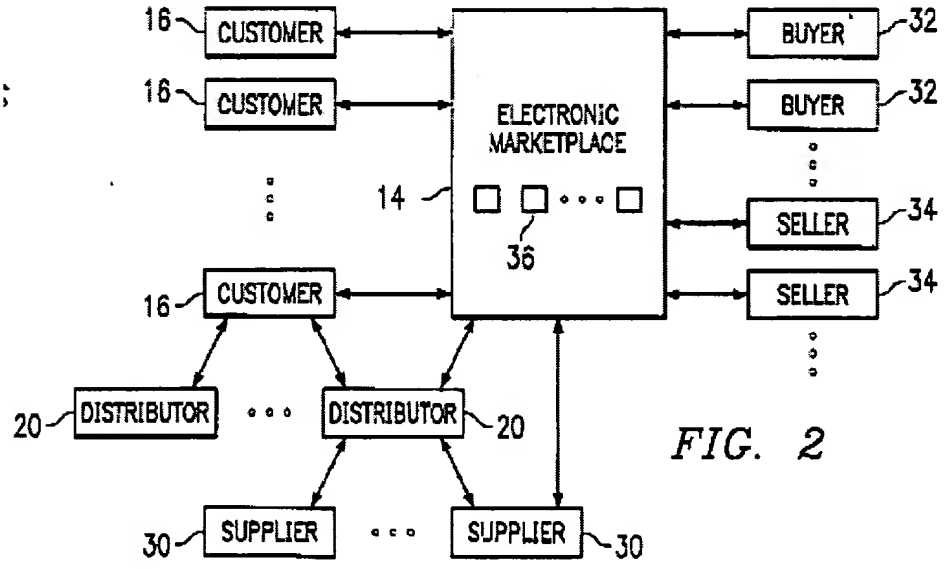

FIG. 2

Figure 7: Yang et al., Figure 2, Supply Chain Network

It would have been obvious to one skilled in the art at the time of the invention that the asset maintenance management system and method, specifically the system's focus on improving the efficiency (availability) of the managed assets through predictive and preventative maintenance, as taught by Roddy et al. would have benefited from leveraging the service parts inventory management and planning system, method and marketplace to improve service parts availability and predictability resulting in less downtime (equipment/materials unavailability, unexpected failures, etc.), lower costs and improved customer satisfaction in view of the teachings of Yang et al. (Yang et al.: Paragraph 0009).

Regarding Claim 3 Roddy et al. teach an asset maintenance management system and method wherein the customer maintenance system comprises a computerized maintenance management system (Paragraph 0027, 0029; Figure 1).

Regarding Claim 4 Roddy et al. teach that the customer maintenance system comprises an enterprise asset management system as discussed above.

Regarding Claim 5 Roddy et al. teach an asset maintenance management system wherein the customer system (agent server, "expert system" – Paragraph 0086, application, module, software; Figures 1, 4, 9) comprises several subsystems (intelligent agents, modules, components, code, etc.) that extract (pull, collect, real-time data collection, monitor, query, etc., Paragraphs 0007-0008; Figures 5, 6; Figure 7, Element 122) information from the customer maintenance and other systems in response to a user entering or modifying a work order (Paragraphs 0029, 0035, 0078, 0084; Figures 2, 9).

Regarding Claim 6 Roddy et al. teach an asset maintenance management system wherein the distributor system(s) comprises a demand forecast (advance demand) subsystem (agent, module, component, application, etc.) that uses the forecast demand data (advance demand notice, message, alert, etc.) to determine (select, calculate) the resources, materials (parts, personnel, equipment) and location (service facility) to execute the maintenance/service work order (Paragraph 0081; Figure 9).

While Roddy et al. teach the utilization of inventory management systems as well as the staging of resources/items necessary for the repair of an enterprise asset Roddy et al. is silent on the details of the inventory management system or the development of a fulfillment (inventory) plan.

Yang et al. teach that the service parts inventory management and planning method and system, in the analogous art of service planning/asset maintenance, for the purposes of providing service parts into a supply chain creates/generates and utilizes inventory, fulfillment and replenishment plans (Paragraphs 0018-0019).

Yang et al. further teach that the service parts inventory management and planning system and method stages (stocks, locates) service parts (items) in the supply chain network in accordance with the fulfillment/inventory plan which is developed/generated in response to future/forecasted demand ("A manager application receives the inventory plan and, according to the inventory plan, initiates one or more services in an attempt to resolve at least a portion of the service parts excesses or needs at one or more of the stocking locations through interaction with one or more other entities.", Paragraph 0007; Paragraphs 0018-0019).

It would have been obvious to one skilled in the art at the time of the invention that the asset maintenance management system and method, specifically the system's focus on improving the efficiency (availability) of the managed assets through predictive and preventative maintenance, as taught by Roddy et al. would have benefited from leveraging the service parts inventory management and planning system, method and marketplace, specifically the systems ability to develop and utilize fulfillment plans, to improve service parts availability and predictability resulting in less downtime (equipment/materials unavailability, unexpected failures, etc.), lower costs and improved customer satisfaction in view of the teachings of Yang et al. (Yang et al.: Paragraph 0009).

Regarding Claim 7 Roddy et al. teach an asset maintenance management system and method wherein the system comprises a subsystem (intelligent agent, software, module, component) that determines the probability that each item (part, component, resource) in the demand forecast (advanced demand notice, by the customer) will be needed during the repair procedure, for use in staging (locating, moving) the items within the supply chain ("...to generate

a prediction of a failure in a mobile asset and at least one likely repair likely to prevent the failure in the mobile asset. A repair weight indicative of the probability that the repair will prevent the predicted failure is determined.", Paragraph 0008; "...make probabilistic determination of a relationship between a predicted failure, and a likely corrective action to prevent the occurrence of the failure.", Paragraph 0052; Paragraphs 0025, 0051-0054; Abstract).

Regarding Claim 8 Roddy et al. teach an asset maintenance management system and method further comprising a subsystem (intelligent agent, software module, component, code) that determines and stages all the necessary service repair resources as discussed above.

The utilization of one or more sources for an item and/or the utilization of one or more equivalent items (i.e. sourcing alternatives; e.g. asking a second supplier to provide a needed repair item if the first/primary supplier is unable to meet the order) in a supply chain is old and well known. However, Roddy et al. is silent on the specific implementation part/item sourcing (selection) process used by the system.

Yang et al. teach a service planning and management system, in an analogous art of asset maintenance management, wherein the system further comprises an order management and fulfillment subsystem that enables a plurality of suppliers to fulfill (broker, bid) an order/item (i.e. sourcing alternatives wherein each supplier represents an alternative source for the same or similar items listed on the work order).

It would have been obvious to one skilled in the art at the time of the invention that the enterprise asset maintenance system and method, specifically the systems focus on improving the efficiency (availability) of the managed assets through predictive and preventative maintenance, as taught by Roddy et al. would have benefited from leveraging the service parts inventory management and planning system, method and marketplace, specifically the system's ability to order/source items/parts from any of a plurality of vendors in the parts marketplace, to improve service parts availability and predictability resulting in less downtime (equipment/materials unavailability, unexpected failures, etc.), lower costs and improved customer satisfaction in view of the teachings of Yang et al. (Yang et al.: Paragraph 0009).

Regarding Claim 9 Roddy et al. teach a method and system for asset maintenance management further comprising a transportation (logistics, shipping; e.g. train; Figure 1) system in communication (linked; Figure 1) with the distributor system (service centers).

Roddy et al. does not expressly teach that a transportation (logistics, shipping, etc.) system coordinates with the distributor system to assist in moving the items within the supply chain.

Yang et al. teach that the service parts inventory management and planning method and system, in the analogous art of service planning/asset maintenance, for the purposes of providing service parts into a supply chain includes the collaboration (coordination) between a plurality of "enterprise systems" (planner systems) including but not limited to the collaboration between distributors, suppliers, customers and the like (Paragraphs 0008-0009, 0043).

Yang et al. does not expressly teach that a logistics/transportation provider is part of the service parts inventory management and planning method, system and marketplace.

Official notice is taken that the participation of a logistics/transportation provider in a supply chain network is old and very well known and provides a mechanism for the planning and management of materials (items, resources, etc.) flow/movement between/amongst the plurality of enterprises in the supply chain network.

It would have been obvious to one skilled in the art at the time of the invention that the asset maintenance management system and method, specifically the system's focus on improving the efficiency (availability) of the managed assets through predictive and preventative maintenance, as taught by Roddy et al. would have benefited from leveraging the service parts inventory management and planning system, method and marketplace to improve service parts availability and predictability resulting in less downtime (equipment/materials unavailability, unexpected failures, etc.), lower costs and improved customer satisfaction in view of the teachings of Yang et al. (Yang et al.: Paragraph 0009).

Further it would have been obvious that the system and method for predictive maintenance & service parts fulfillment in a supply chain network in view of the combined

teachings of Roddy et al. and Yang et al. would have included as one of the plurality of participating entities (enterprises) in the supply chain network a logistics/transportation provider, having their own "planning system" to be integrated into the supply chain, in order to facilitate, plan and manage the transportation (shipment, movement) of items amongst/between the plurality of enterprises in the supply chain network; the resultant system providing more robust scheduling and planning capabilities.

Regarding Claims 10 and 11 Roddy et al. teach an asset maintenance management system and method wherein the plurality of systems in the supply chain (i.e. transportation, supplier, distributor, customer, etc.) are communicate and monitor the movement of the repair items within the supply chain (Paragraphs 0007-0008, 0026-0029; Figure 1).

Regarding Claim 12 Roddy et al. teach an asset maintenance management system ensures that service items (parts, resources) are monitored to insure that the work order can be executed as planned as discussed above.

Roddy et al. does not expressly teach an enterprise asset maintenance management system and method wherein the system (intelligent agent, component, code, module) forms (creates, generates) a corrective (alternative, updated, revised) fulfillment plan if the subsystem determines that the items are not being moved with the supply chain to meet the expected use during the repair procedure (i.e. as desired).

Official notice is taken that it is old and well known that one of the responsibilities/goals of a supply chain and other business systems related to the flow of materials is to ensure that items are moved within the supply chain as desired (e.g. on-time, right place, right time, etc.) and that if the items are not being moved within the supply chain according to plan/schedule (as desired) that the system/supply chain needs to take corrective action to prevent the system/supply chain interruptions due errant (missing, misrouted, incorrect, late, etc.) materials.

It would have been obvious to one skilled in the art at the time of the invention that the asset maintenance management system and method, with its ability to schedule, monitor and manage the plurality of service resources, needed to repair/maintain assets, based on a plurality

of constraints (e.g. part/resource availability), would have benefited from employing a number of well known supply chain (work flow, enterprise planning) techniques including taking corrective action if the items in the supply chain are not being moved as desired; the resultant system ensuring that items are being moved within the supply chain according to the developed (desired) plan/schedule).

Regarding Claim 13 Roddy et al. teach a method and system for managing asset maintenance wherein the system comprises an equipment knowledge base (database) for determining the probability of need for each item for use in staging the items within the supply chain ("...to generate a prediction of a failure in a mobile asses and at least one likely repair likely to prevent the failure in the mobile asset. A repair weight indicative of the probability that the repair will prevent the predicted failure is determined.", Paragraph 0008; "...make probabilistic determination of a relationship between a predicted failure, and a likely corrective action to prevent the occurrence of the failure.", Paragraph 0052; Paragraphs 0025, 0051-0054; Abstract).

Regarding Claim 14 Roddy et al. teach an asset maintenance management system and method wherein the customer system (agent server, module) extracts (pulls, retrieves, collects, monitors) information from the customer maintenance system for populating the equipment knowledge base (database), the information being used in determining the probability of need of items specified in future work orders (advanced demand notice, demand forecast; Paragraphs 0007-0008, 0025, 0051-0054; Abstract; Figures 5-7).

Regarding Claim 15 Roddy et al. teach an asset maintenance management method and system in a supply chain network (network: collection of businesses/entities, interconnected systems/processes, communication network) comprising:

- a customer maintenance system (Paragraph 0007; Figure 4) into which information pertaining to a work order (repair order, repair action; Paragraph 0082; Figure 9) is entered including information that identifies the piece of equipment (asset ID; Figure 2, Element 30) to be repaired and one or more items (parts, materials, personnel, equipment, facilities, service center, etc.) expected to be used during a repair procedure (service; e.g. materials/resource availability, inventory management; Paragraphs 0082-0083, 0087);

- a customer system (agent server, application, module, software, "expert system", Paragraph 0086; Figures 1, 4, 9) in communication (Internet, global communication/information network; Paragraphs 0006, 0027; Figure 1) with the maintenance system which extracts (pulls, collects, real-time data collection, monitors, queries, etc., Paragraph 0007-0008; Figures 5, 6; Figure 7, Element 122) from the maintenance system (subsystem) information that identifies what repairs/maintenance are to be performed wherein the maintenance specifies the parts, equipment, and other resources necessary to perform the maintenance activity information (Paragraphs 0075, 0086; Figure 7, Element 134) to create an advanced (forecast, future, predicted, planned, projected, etc.) demand notice (signal, alert, message, etc.) order (work order, repair action, service recommendation, demand forecast, predicted repair/service/maintenance, purchase order; Paragraphs 0037; Figures 2, 3, 9) that identifies the items; and

- a distributor (maintenance repair centers, repair facilities) system in communication with a plurality of systems that respond to the advanced demand notice (message, signal) order (work/service order, work scope, service recommendation) to initiate the staging (placement, movement) of items expected to be used as part of the repair procedure ("The recommended action may be supplied directly into the train control system. At this time, the data center or service personnel may evaluate the most logical repair location in terms of various criteria, such as train proximity, parts, repair equipment availability, manpower availability, etc. The service recommendation automatically triggers the creation of an electronic work order 172 within a service shop management system. A notification is then sent, such as via an e-mail message or by providing information on an Internet web page, to the service team detailing the parts and labor necessary for a timely and accurate repair.", Paragraph 0086; "As soon as the service team receives information about the necessary repair, team members gather or reserve parts, equipment and personnel needed to perform the corrective action.", Paragraph 0087, "...inventory management, will be improved to have the correct part available when it is needed.", Paragraph 0081; Paragraphs 0082-0088; Figures 3-4, 8, 9).

While Roddy et al. teach that the asset management system and method utilizes expert systems and well known e-Business technologies (Paragraphs 0081, 0086) Roddy et al. does not expressly teach the utilization well known agent technologies (techniques, architecture, design pattern, method, systems, etc.).

Yang et al. teach that the service parts inventory management and planning system, in an analogous art of service planning/asset maintenance, for the purposes of providing service parts into a supply chain utilizes a transaction broker for the purposes of facilitating the transactions (communications, messages) between the plurality of entities and systems in the supply chain network (Paragraph 0028).

Yang et al. does not expressly teach that the service parts method, system and marketplace utilize intelligent agents (artificial intelligence).

Official notice is taken that the use of intelligent agents (artificial intelligence, agent based systems) in e-Business, eCommerce, Supply Chain Management and the like is well established and well known. More specifically it is old and well known that a network of intelligent software modules (agents) can together dynamically (collaboratively) manage the supply chain wherein each module (agent) is an: expert at its task, thereby optimizing its goals; coordinates its decisions with other modules, thereby optimizing supply chain wide goals; and can quickly responds to changes in cooperation with other modules.

It would have been obvious to one skilled in the art at the time of the invention that the asset maintenance system and method as taught by Roddy et al. would have benefited from leveraging the service parts inventory management and planning system, method and marketplace to improve service parts availability and predictability resulting in less downtime (equipment/materials unavailability, unexpected failures, etc.), lower costs and improved customer satisfaction in view of the teachings of Yang et al. (Yang et al.: Paragraph 0009).

Further it would have been obvious to modify the system and method for predictive maintenance & service parts fulfillment in a supply chain network in view of the combined teachings of Roddy et al. and Yang et al. to utilize agent technologies, tools and techniques (artificial intelligence, expert systems, etc.) to facilitate the collaboration and implementation of the plurality of enterprises in the supply chain network; the resultant system being more capable of managing the predictive and preventative maintenance of enterprise assets in a substantially automated manner.

(10) Response to Argument

10.1. The applicant argues, see Appeal Brief, Page 6, Lines 7-9, that the Roddy et al. fails to disclose, teach or suggest all of the elements set forth in the claims when the claims are considered as a whole. Specifically applicant argues that Roddy et al., Yang et al. and/or the prior art of record fails to disclose, teach or suggest all the elements of Claim 1, specifically the use of agents (see Appeal Brief, Page 5, Lines 1-3).

The examiner respectfully disagrees. Roddy et al. teach a "Computerized method and system for identification and evaluation of a repair likely to prevent the failure of an asset" (Abstract) in a supply transaction network (supply chain, transportation network, etc.; Paragraph 0003) wherein the computerized maintenance management system/method utilizes "**processors**" ("computers", "expert systems", "tools", "applications", software, agents, etc.) to:

- monitor, collect and store, in multiple databases, a plurality of asset information (usage, faults, work orders, repair history, parts inventories, etc.; Figure 4; Figure 7, Element 122; Figure 8, Element 141-142; Figure 9, Element 174);

- recognize/detect and predict asset failures/maintenance needs via computerized analysis of the plurality of information **extracted** from one or more of the plurality of databases/systems including but not limited to work orders (Paragraphs 0071-0075 and 0082-0086; Figure 4, Elements 1006, 1010, 1012; Figure 7, Elements 124, 126, 128, 130 and 132; Figure 8, Element 143; Figure 9, Element 169);

- evaluate/diagnose and recommend one or more service actions/maintenance activities based on the plurality of asset information **extracted** from one or more of the plurality of databases/systems wherein the recommendations include determining an optimal time/place (based on at least the availability of the necessary parts and personnel) and reserving/scheduling the requisite resources, materials, equipment and personnel (Paragraphs 0007-0008, 0025, 0034-0035, 0071-0075, 0082-0086 and 115; Figure 2, Elements 48, 58, 60; Figure 4, Elements 1010, 1012, 1014; Figure 7, Elements 132, 134; Figure 8, Elements 143-145); and

- communicate/present the service recommendations/evaluations as well as the results of the computerized analysis to a plurality of systems (computers) and users (personnel) for the purposes of enabling those systems/users to interact/collaborate with the computerized maintenance management system method/system (Figure 2, Elements 56, 62, 68; Figure 7, Element 135; Figure 9, Element 176).

While Roddy et al. does not expressly use the phrase "agent" Roddy et al. teach a computerized maintenance management system and method comprising a plurality of agents, agents being commonly defined as software modules, code, objects, processors, expert systems, tools or the like, wherein the agents serve to automatically monitor, analyze, evaluate and predict asset failures as well as generate service recommendations for addressing those asset failures prior to the failure itself, as discussed above.

Official notice is taken, as cited and unchallenged in the office actions dated June 6, 2005 and September 21, 2005, that the use of agents (objects, software agents, intelligent agents) in e-Business, eCommerce, Supply Chain Management or the like is now considered to be prior art.

While the officially noticed fact(s) went unchallenged by the applicant support for these officially noticed facts including motivations as to why one skilled in the art at the time of the invention would have utilized agents in the computerized maintenance management system and method of Roddy et al. is provided in at least the following *previously cited* reference Hinkkanen et al., Distributed Decision Support Systems for Real-Time Supply Chain Management Using Agent Technologies (1997), as cited in the applicant's Information Disclosure Sheet dated September 25, 2001.

Hinkkanen et al. teach that utilizing agents for distributed and real-time systems, like the system/method of Roddy et al., is obvious and ideal ("with this real-time information and network connectivity (both inter- and intra-), the use of software agents (or intelligent agents) becomes very natural." (Last Paragraph, Page 281; "Software agents are an ideal technology for real-time supply chain management. Since almost all information is being captured directly in real-time (such as inventory depletion via barcodes), a software agent can easily be implemented to monitor these special situations.", Second Paragraph, Page 282);

10.2. The applicant argues, see Appeal Brief Page 7, Lines 1-8; Page 8, Line 7-10, that Roddy et al. fails to disclose, teach or suggest that any system **extracts** information from a work order (e.g. items expected to be used during the repair, emphasis added).

The examiner respectfully disagrees. Roddy et al. teach a computerized maintenance management method and system wherein a plurality of asset information is **processed** by the **system**, wherein processing includes extracting (retrieving) the information from its source(s), processing the data (analysis, evaluation, etc.), exporting/storing and presenting/communicating the processing results (Paragraphs 0071-0076, 0082-0086 and 0110-0115; Figures 7 and 9, emphasis added).

More specifically Roddy et al. teach extracting information related to the repair/maintenance of an asset from at least a work order thereby enabling the computerized system/method to determine the optimal maintenance facility/location, schedule/reserve/order the appropriate service activity resources (parts, materials, personnel, etc.) and create an advanced demand notice for the items necessary for the repair ("Scheduling maintenance and/or **Pre-ordering** needed parts for remediation and improvement.", Paragraph 0115, emphasis added).

- Figure 9 depicts the extraction of data/information **from the work order** (element 172) subsystem to both the Data Analysis (element 169) and Monitoring Board (element 174) databases/subsystems as well as the two-way data flow (extract, import)

between the work order and execute repairs subsystems/processors (element 170, emphasis added).

- Paragraphs 0071-0078 and Figure 7 disclose in detail the system's ("processing element 118") utilization of the plurality of maintenance related data including work orders in the monitoring, identifing prioritizing, and predicting assets failures wherein the "processing element 118 is also preferably **programmed to instruct a human operator** at monitoring station 114: (1) whether to correct the fault prior to scheduled maintenance of the vehicle, (2) when to correct the fault, (3) what fault to correct (preferably including what **parts or components** of the vehicle to repair), and (4) the optimal facility at which to correct the fault. The optimal repair facility is dependent upon the proximity of the vehicle to a facility and whether the facility has the capability, including parts, service equipment and personnel expertise necessary to repair the fault. Personnel at the service center are **alerted** to the planned arrival of the mobile asset at step 135." (emphasis added); and
- Paragraphs 0082-0086 and Figure 9 disclose in detail the work order flow module (subsystem) wherein:
    - "Information will be electronically **accumulated** to develop the work scope, and at least part of this information may be communicated via the global information network 15 as illustrated in FIG. 1. By way of example and not of limitation, the information may include the

following: performance information from the product 154, **repair history** information 156, information from the customer 158, **required and optional** repairs 160, and information learned during inspection 162." (Paragraph 0082, emphasis added);

- "The information **obtained from the work order** completions will allow for monitoring the status of the repairs and will also allow customers 176 to get real-time status of their product in the repair cycle. The data will also be used to improve reliability of the product and to compare and improve field shop processes across field sites." (Paragraph 0085, emphasis added).; and
- "The service recommendation **automatically triggers the creation of an electronic work order 172** within a service shop management system. A **notification** is then sent, such as via an e-mail message or by providing information on an Internet web page, to the service team **detailing the parts** and labor necessary for a timely and accurate repair.", (Paragraph 0086, emphasis added).

Further it is noted that the definitive purpose of work orders/work order systems, such as the computerized maintenance management system and method with its work order subsystem taught by at taught by Roddy et al., is to enable other systems, users or processes to extract, interact and respond to the plurality of captured and stored in

the work order evidenced by at least the following previously cited reference Hoth et al., U.S. Patent No. 5,710,723 (Column 1, Lines 59-68; Column 2, Lines 1-15; Figure 1);

10.3 The applicant argues, see Appeal Brief Page 8, Line 18-19, that Roddy et al. fails to disclose, teach or suggest any system that **responds** to an advanced demand notice order based on the extracted work order information (emphasis added).

The examiner respectfully disagrees. Roddy et al. teach that the computerized maintenance management system and method and its associated systems, users and/or subsystems respond to an advanced demand notice order generated by the system (Paragraphs 0037, 0071-0050082-0086; Figures 2, 3, 9) wherein the order/notice identifies the resources (parts, technicians, items, etc.) needed for the repair/maintenance activity:

- "a work order flow module 150 is used to control the various repair processes. One exemplary step or action is to develop an accurate work scope **152 in response to a service recommendation**, such as is developed at step 143 of FIG. 8. Information will be electronically accumulated to develop the work scope, and at least part of this information may be communicated via the global information network 15 as illustrated in FIG. 1. By way of example and not of limitation, the information may include the following: performance information from the product 154, repair history information 156, information

from the customer 158, required and optional repairs 160, and information learned during inspection 162." (Paragraph 0082, emphasis added);

- "The service recommendation **automatically triggers the creation of an electronic work order 172** within a service shop management system. A **notification** is then sent, such as via an e-mail message or by providing information on an Internet web page, to the service team **detailing the parts** and labor necessary for a timely and accurate repair.", (Paragraph 0086, emphasis added);
- "The **recommendation** also **sets a proximity trigger to notify** the service shop when the locomotive is within a certain distance of the repair location. As soon as the service team receives information about the necessary repair, **team members gather or reserve** the parts, equipment and personnel needed to perform the corrective action 145. The approaching locomotive may automatically forward a notification message to the service repair shop indicating that it is approaching." (Paragraph 0087, emphasis added); and
- "Value added services based on some or all of the preceding stored **knowledge**, with or without the assistance of **processing or expert systems** that may be developed in conjunction with the gathering of historical performance data to establish data-driven signatures or **triggers** for maintenance escalation." (Paragraph 0110, emphasis added). "Such systems may include:" (Paragraph 0111) "Scheduling maintenance and/or **Pre-ordering needed parts** for remediation and improvement." (Paragraph

0115, emphasis added; i.e. pre-ordering parts or scheduling/reserving the necessary material for a repair/service activity implicitly involves other users/systems responding to those requests/notifications by providing the ordered resources).

10.4. The applicant argues, see Appeal Brief, Page 9, Lines 7-9, and 15-18, that a convincing line of reasoning has not been presented as to why an artisan would have modified Roddy et al. to use intelligent agents in view of the officially noted fact(s) and subsequently that the current line of reasoning employs "hindsight reasoning", see Appeal Brief, Page 10, Lines 8-11.

The examiner respectfully disagrees. As discussed above the use of agents/agent technologies provide a plurality of well-known benefits for systems like the computerized maintenance management system and method as taught by Roddy et al. Support for this officially noticed and unchallenged noticed including motivations as to why one skilled in the art at the time of the invention would have utilized agents in the computerized maintenance management system and method of Roddy et al. is evidenced at least by Hinkkanen et al.

Hinkkanen et al. teach that "Software agents are an ideal technology for real-time supply chain management. Since almost all information is being captured directly in real-time (such as inventory depletion via barcodes), a software agent can easily be implemented to monitor these special situations." (Second Paragraph, Page 282) and

that "the fact that each agent is autonomous and independent allows for the necessary flexibility to dynamically change the agent organization." (i.e. to change/adapt the system to changes it the business, its business process and/or technologies; Paragraph 3, Page 285).

Further in response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Scott L. Jarrett
Examiner
Art Unit 3623

February 2, 2006

Conferees:

Tariq Hafiz

SPE 3623

Susanna Diaz SMD

Primary Examiner 3623

TARIQ R. HAFIZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600